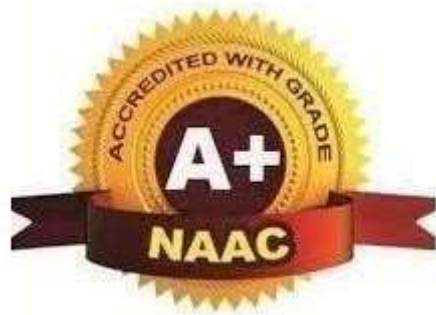




TULSIRAMJI GAIKWAD-PATIL
College of Engineering & Technology
Mohgaon, Wardha Road, Nagpur - 441 108



Bachelor of Technology SoE and Syllabus 2025

(Department of Science and Humanities)

Vision of Institute

To emerge as a learning Center of Excellence in the National Ethos in domains of Science, Technology and Management.

Mission of Institute

M1- To strive for rearing standard and stature of the students by practicing high standards of professional ethics, transparency and accountability.

M2- To provide facilities and services to meet the challenges of Industry and Society. M3- To facilitate socially responsive research, innovation and Entrepreneurship.

M4- To ascertain holistic development of the students and staff members by inculcating knowledge and profession as work practices.



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Department of Basic Sciences and Humanities

Scheme of Instruction for First Year of B. Tech. (UG) Programme Group-B Semester – I (EE/ECE)

SN	Sem	Type	BoS / Dep t	Sub. Code	Subject	T/P	Contact Hours			Hrs	Credits	% Weightage			TOTAL	ESE Duration Hours
							L	P	SL			CT/A	CA	ESE		
FIRST SEMESTER (GROUP-B)																
1	1	BSC	S&H	BSH41101	Linear Algebra and Calculus	T	4	0	2	6	4	30	10	60	100	3
2	1	BSC	S&H	BSH41109	Energy and Battery Technology	T	3	0	2	5	3	30	10	60	100	3
3	1	BSC	S&H	BSH41110	Energy and Battery Technology -Lab	P	0	2	-	2	1	25	-	25	50	-
4	1	ESC	ECE	BEC41101	Digital Circuits and Design	T	3	0	2	5	3	30	10	60	100	3
5	1	IKS	S&H	BSH41204	Indian Ancient Knowledge	T	2	0	2	4	2	14	05	30	50	1
6	1	ESC	ME	BME41101	IDEA-Lab & Engineering Workshop	P	0	4	-	4	2	50	-	-	50	-
7	1	ESC	CE	BCE41102	Environment Sustainability -Lab	P	0	2	-	2	1	25	-	25	50	-
8	1	VSEC	CSE	BCS41104	Fundamentals of Computer-Lab	P	0	2	-	2	1	25	-	25	50	-
9	1	VSEC	S&H	BSH41205	Social Internship	P	0	2	-	2	1	25	-	-	25	-
10	1	PCC	ECE	BEC41102	Digital Circuits and Design -Lab	P	0	4	-	4	2	25	-	25	50	-
11	1	CC	S&H	BSH41X01	Liberal Learning Module-I	P	0	4	-	4	2	50	-	-	50	-
TOTAL FIRST SEM							12	20	08	40	22	330	35	310	675	10
SECOND SEMESTER (GROUP-B)																
1	2	BSC	S&H	BSH41201	Differential Equation and Statistics	T	4	0	2	6	4	30	10	60	100	3
2	2	BSC	S&H	BSH41207	Semiconductor Physics & Optics	T	3	0	2	5	3	30	10	60	100	3
3	2	BSC	S&H	BSH41208	Semiconductor Physics & Optics -Lab	P	0	2	-	2	1	25	-	25	50	-
4	2	ESC	EE	BEE41201	Principle of Electrical Engineering	T	3	0	2	5	3	30	10	60	100	3
5	2	ESC	EE	BEE41202	Principle of Electrical Engineering -Lab	P	0	2	-	2	1	25	-	25	50	-
6	2	ESC	ME	BME41202	Engineering & Computer Graphics	T	2	0	2	4	2	15	5	30	50	1
7	2	ESC	IT	BIT41205	‘C’ Language Lab	P	0	2	2	4	1	25	-	25	50	-
8	2	VSEC	CE	BCE41203	Computer Aided Drawing-Lab	P	0	2	-	2	1	25	-	25	50	-
9	2	VSEC	S&H	BSH41202	Professional Etiquette-Lab	P	0	2	-	2	1	25	-	-	25	-
10	2	AEC	S&H	BSH41204	Digital Wellness & Basic Communication Lab	P	0	4	-	4	2	50	-	-	50	-
11	2	CC	S&H	BSH41Y01	Liberal Learning Module-II	P	0	4	-	4	2	50	-	-	50	-
TOTAL SECOND SEM							12	18	10	40	21	330	35	310	675	10
Course Category		BSC/ESC (Basic Science Course/ Engineering Science Course.)		PCC (Programme Core courses)	Multidisciplinary courses	VSEC (Skill Course)	Social Science & Management				Experiential Learning Courses		CC (Co-Curricular Courses)			
							AEC (Ability Enhancement Course)		IKS (Indian Knowledge System)							
Credits SEM-I		08 / 06		--	--	02	02		--		--		02			
Credits SEM-II		08 / 07		02	--	02	--		02				02			
Cumulative Sum		16 / 13		02	--	04	02		02		--		04			

PROGRESSIVE TOTAL CREDITS: 22+21=43

				July, 2025	4.00	Applicable for AY 2025-26 Onwards
Chairperson	Dean Academics	Vice Principal	Principal	Date of Release	Version	



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Department of Basic Sciences and Humanities

Scheme of Instruction for First Year of B. Tech. (UG) Programme Group-B (EE/ECE)

Liberal Learning Modules for SEM-I

SN	Sem	Type	BoS / Dept	Sub. Code	Subject	T/P	Contact Hours			Credits	Weightage		
							L	P	Hrs		INT (1-Certificate)	ESE (MCQ)	External Practical
1	1	CC	S&H	BSH42Y01	Art & Craft	P	2	2	4	2	25	-	25
2	1	CC	S&H	BSH42Y02	Poster & Video Design	P	2	2	4	2	25	-	25
3	1	CC	S&H	BSH42Y03	IPD (Integrated of Personality Development)	P	2	2	4	2	25	25	-
4	1	CC	S&H	BSH42Y04	Sports (Outdoor & Indoor)	P	2	2	4	2	25	-	25
5	1	CC	S&H	BSH41X05	Yoga Practices & NSS	P	2	2	4	2	25	-	25
6	1	CC	S&H	BSH41X06	Interactive English (Level-1)	P	2	2	4	2	25	25	-
7	1	CC	S&H	BSH41X07	Gateway to Competitive Exams (Level-1)	P	2	2	4	2	25	25	-
8	1	CC	S&H	BSH41X08	Foreign Language -French (Level-1)	P	2	2	4	2	25	25	-
9	1	CC	S&H	BSH41X09	Foreign Language –German (Level-1)	P	2	2	4	2	25	25	-
10	1	CC	S&H	BSH41X10	Foreign Language –Japanese (Level-1)	P	2	2	4	2	25	25	-

Liberal Learning Modules for SEM-II

SN	Sem	Type	BoS / Dept	Sub. Code	Subject	T/P	Contact Hours			Credits	Weightage		
							L	P	Hrs		INT (1-Certificate)	ESE (MCQ)	External Practical
1	2	CC	S&H	BSH41X01	Art of Theater	P	2	2	4	2	25	-	25
2	2	CC	S&H	BSH41X02	Fundamental of Music	P	2	2	4	2	25	-	25
3	2	CC	S&H	BSH41X02	CPD (Communication for Personality Development)	P	2	2	4	2	25	-	25
4	2	CC	S&H	BSH41X03	EBCD (Every Body Can Dance)	P	2	2	4	2	25	-	25
5	2	CC	S&H	BSH42Y05	Indian Cuisine	P	2	2	4	2	25	-	25
6	2	CC	S&H	BSH42Y06	Interactive English (Level-2)	P	2	2	4	2	25	25	-
7	2	CC	S&H	BSH42Y07	Gateway to Competitive Exams (Level-2)	P	2	2	4	2	25	25	-
8	2	CC	S&H	BSH42Y08	Foreign Language -French (Level-2)	P	2	2	4	2	25	25	-
9	2	CC	S&H	BSH42Y09	Foreign Language –German (Level-2)	P	2	2	4	2	25	25	-
10	2	CC	S&H	BSH42Y010	Foreign Language –Japanese (Level-2)	P	2	2	4	2	25	25	-

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Department of Basic Sciences and Humanities

Program: B. Tech First Year (EE,ECE)

Semester-I **Linear Algebra & Calculus: BSH41101**

Teaching Scheme		Examination Scheme (Th)		Examination Scheme(P)	
Theory (Th)	4 Hrs/week	CT-I	15 Marks	-	-
Practical (P)	-	CT-II	15 Marks	-	-
Total Credits	4 (Th) = 4	CA	10 Marks	-	-
Duration of ESE:3Hrs		ESE	60 Marks	-	-
		Total Marks	100 Marks	-	-

Pre-Requisites: AICTE Bridge course, Basics of Mathematics

Course Objectives:

1	To identify algebraic problems from practical areas and obtain the solution in certain cases.
2	To expose students to understand the basic importance of Differential Calculus and Integral Calculus.
3	To understand different solution techniques of solving Beta and Gama Function and also understand solution of simultaneous equation by matrix method.
4	To apply your understanding of the concepts, formulas, and problem-solving procedures.
5	To analyze and apply properties of sequences and series, including their convergence and sums, in mathematical and real-world problems.


Course Contents

Unit I	Matrices: Introduction to rank of a matrix; Rank nullity theorem, Eigen values and Eigen vectors, Consistency of a system of equations, Cayley Hamilton Theorem, Sylvester's theorem
	Activity 1: Perform basic operations of matrices by Sagemath Activity 2: Illustrate Eigen values and Eigen Vectors by Sagemath
Unit II	Differential Calculus: Indeterminate Forms L'Hospital Rule, Taylor's and Maclaurin's series (for one variable), Maxima and Minima, Successive differentiation-Leibnitz Theorem, Rolle's theorem, Lagrange's mean value theorem, Cauchy's mean value theorem.
	Activity1: To Learn Calculus with SageMath Activity 2: Differential Calculus and its Application by Sagemath
Unit III	Integral Calculus: Introduction to Gamma Function & Properties of Gamma Function, Introduction to Beta Function & Properties of Beta Function, Relation between Beta & Gamma Function, Leibnitz's rule for differentiation under integral sign, Tracing of Cartesian and Polar curves
	Activity1: To trace the curve with Scilab. Activity 2: To trace the curve with Maple
Unit IV	Calculus of Function of several variables: Differentiability of function of several variables, Partial Derivatives, Euler's theorem on homogeneous function, Implicit function, Jacobian and their applications, Chain Rule
	Activity1: To solve partial derivative by Sagemath Activity 2: Cross word puzzle based on Partial Derivative
Unit V	Sequence & Series: Sequence, types of sequence, test of convergence of sequences, Cauchy sequence, infinite series, power series, Alternating series, tests of convergence and absolute convergence of series.
	Activity 1: Find the missing term based on logic or arithmetic rules Activity 2: Cross word puzzle based on Sequence & Series

Chairperson

Text Books	
T.1	Higher Engineering Mathematics by Bali Lyenger (Laxmi Prakashan) 9 th Edition
T.2	Advance Engineering Mathematics by Ervin Kreyszig's 9 th Edition
T.3	H. K. Dass, Advanced Engineering Mathematics, S. Chand, Reprint, 2014.
T.4	Outline Series, McGraw Hills, 4th Edition, 2016.
T.5	P.N.Wartikar and J.N.Wartikar, Applied Mathematics, 4th Edition, Vidyarthi GrihaPrakashan.
T.6	GB Thomas and R.L. Finney, Calculus and Analytic geometry 9 th edition, Pearson, Reprint2002.
Reference Books	
R.1	Gilbert Strang: Linear Algebra and Its Applications (Paperback), Nelson Engineering (2007)
R.2	“Advanced Engineering Mathematics” by Erwin Kreyszig's (Wiley India) 9 th edition
R.3	A textbook of Engineering Mathematics by N.P. Bali, Manish Goyal, Laxmi Publication, Reprint 2010
R.4	Higher Engineering Mathematics by B. S. Grewal, Khanna Publisher 35 th edition.
Useful Links	
1	https://archive.nptel.ac.in/courses/111/108/111108157/
2	https://archive.nptel.ac.in/courses/111/104/111104144/
3	https://archive.nptel.ac.in/courses/111/104/111104092/

CO	Course Outcomes	CL	Class Sessions
CO1	Implement the concept of matrices to check existence of solution of system of linear Simultaneous equation.	3	9
CO2	Apply the concept of maxima, minima and successive differentiation in analysis of engineering problems.	3	9
CO3	Solve improper integrals using beta, gamma functions	3	9
CO4	Use of Partial differentiation to Solve Jacobian and Chain Rule	3	9
CO5	Utilize the concepts of sequences and series to address problems across mathematical and scientific domains	3	9


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Department of Basic Sciences and Humanities

Program: B. Tech First Year (EE,ECE)

Semester-I **Energy and Battery Technology: BSH41109**

Teaching Scheme		Examination Scheme(Th)		Examination Scheme(P)	
Theory(Th)	3 Hrs/week	CT-I	15 Marks	-	-
Practical(P)	2 Hrs/week	CT-II	15 Marks	-	-
Total Credits	3(Th)+1(P)=4	CA	10 Marks	CA	25 Marks
Duration of ESE:3 Hrs		ESE	60 Marks	ESE	25Marks
		Total Marks	100 Marks	-	50 Marks

Pre-Requisites: AICTE Bridge Course, Energy sources, Electrochemistry, Water technology, Battery technology, polymers

Course Objectives:

1. To gain the knowledge of Energy sources, types & Application.
2. To inculcate knowledge about Electrochemistry.
3. To enable to students to upgrade the existing knowledge of water technology.
4. To enlighten the students to the basic process of battery technology.
5. To gain the knowledge on synthesis, properties and applications of polymers.

Course Contents

Unit I	Energy Sources: Introduction of energy, types of Energy(conventional and non-conventional energy sources), Introduction of fuels, classification and application, Calorific value determination of solid, liquid and Gas, Analysis of solid fuels, Fractional distillation, CNG and Bio-Diesel.
	Class activity: Creative poster making on any one non-conventional energy source .
Unit II	Electrochemistry: Basics of Electrochemistry, Conductors and Insulators, Specific Conductance, Molar Conductance, Equivalent Conductance, Laws of Electrochemistry, Concept of Galvanic Series, Electrode potential, Standard electrode potential, Cell potential and EMF of a cell, Nernst equation and its application, Electroplating Process: Principle, Factors Influencing Electroplating and their applications, Numerical.
	Class activity: MCQ based quiz base on basics of Electrochemistry.
Unit III	Water pollution and Softening processes: Introduction, Sources of pollution, Hardness Coagulation, Sterilization, Softening process (Zeolite process and Ion Exchange Process) Boiler trouble due to scale and sludge, Desalination of water by Reverse osmosis.
	Class activity: Crossword Puzzle on the basis of softening process of water.
Unit IV	Battery Technology: Introduction of batteries, Primary and secondary batteries, Types of Batteries with construction, working and their applications (Carbon-Zn, Alkaline Zinc, Ni-Cd, Lead Acid battery, Lithium ion battery) H ₂ -O ₂ Fuel cell, Methanol Fuel Cell and its applications, Differences between Battery and Fuel cell, Recycling and safe disposal of batteries.
	Class activity: Pattern based quiz on application of battery
Unit V	Polymer Science: Introduction, Classification of Polymers, Uses of commercially important polymers with synthesis, properties and applications, Polyethylene, PVC, Teflon, Terylene, Conducting & Insulating Polymers, polyaniline, polypyrrole and polylactic acid.
	Class activity: Prepare the chart of types of polymer with their monomers, properties and application.

Chairperson

Text Books	
T.1	Engineering Chemistry by S.S. Dara, 10th Edition. S. Chand & Co
T.2	Engineering Chemistry Dr. Avinash Bharti, V.K. Walekar, 1st Edition. Tech Max.
T.3	Textbook of Engineering Chemistry: P.C Jain & Monica Jain, 15th Edition. Dhanpatrai publication Ltd
Reference Books	
R.1	Applied Chemistry: Narkhede & Bhake, 1st Edition. Das Ganu Prakashan.
R.2	Engineering Chemistry Dr. Avinash Bharti, V.K. Walekar, 1st Edition. Tech Max
Useful Links	
1	https://nptel.ac.in/courses/103/103/103103206/
2	https://nptel.ac.in/courses/103/108/103108162/
3	https://nptel.ac.in/courses/104/105/104105124/

LIST OF EXPERIMENTS (Energy and Battery Technology: BSH41110)		
1	Determination of Moisture Content or Volatile Matter & Ash Content of Coal sample.	CO1
2	Determination of Flash Point of given Oil by Pensky Martine or Abel's Apparatus	CO1
3	Determination of pH of given Solution.	CO2
4	Determination of Electrode Potential by Galvanic Cell	CO2
5	Determination of Hardness of Water Sample by Complexometric Method.	CO3
6	Determination of Calcium Ion & Magnesium Ion Separately.	CO3
7	Determination of Current by using salt water battery.	CO4
8	Estimation of amount of zinc liberated during electrolysis.	CO4
9	Determination of Saponification value of Bio-Degradable Polymer.	CO5
10	Synthesis of Conducting Polymer. (Poly Aniline)	CO5

Text Books	
T.1	Experiments and Calculations in Engineering Chemistry by S. Chand
T.2	Practical Engineering Chemistry: By S.N. Narkhede, Dr. R.T. Jadhav, Dr. A.B. Bhake
Reference Books	
R.1	A textbook on experiment and calculation By S.S. Dara
R.2	Inorganic Quantitative analysis, Vogel
Useful Links	
1	https://nptel.ac.in/courses/108/104/10810412345/
2	http://nptel.ac.in/courses/1171012546/

CO	Course Outcomes	CL	Class Sessions
CO1	Understand the types of Energy sources and its properties and application	2	9
CO2	Illustrate different laws of Electrochemistry.	3	9
CO3	Differentiate water pollution and its softening process.	3	9
CO4	Interpret different types and applications of batteries.	3	9
CO5	Predict the types and applications of commercial polymers.	3	9


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Department of Basic Sciences and Humanities

Program: B. Tech First Year (EE,ECE)

Semester-I **Digital Circuits and Design (BEC41101)**

Teaching Scheme		Examination Scheme(Th)		Examination Scheme(P)	
Theory (Th)	3Hrs/week	CT-I	15 Marks	-	-
Practical (P)	-	CT-II	15 Marks	-	-
Total Credits	3(Th) =3	CA	10 Marks	-	-
Duration of ESE:3Hrs		ESE	60 Marks	-	-
		Total Marks	100 Marks	-	-

Pre-Requisites: Bridge Course

Course Objectives:

1.	To understand different number systems such as Binary, Decimal, Octal, and Hexadecimal.
2.	To develop and analyze logical expressions and circuits using logic gates, Boolean algebra, and Karnaugh Maps.
3.	To impart knowledge of fundamental combinational logic circuits such as adders, subtractors, multiplexers, encoders, and decoders.
4.	To understand the working principles and types of flip-flops used in sequential circuit design and their role in memory elements.
5.	To introduce various types of counters and shift registers, and their application in digital timing and display systems.

Course Contents

Unit I	Number system: Binary, Decimal, Octal & Hexadecimal, Conversion of one number system to another, BCD number system, Addition & Subtraction of Binary number system, 1's complement, 2's Complement Activity 1: MCQ Test/ Digital Number System Conversion Race
Unit II	Logic Gates: Symbol & truth table of AND gate, OR gate, NOT gate, NAND gate, NOR gate, Ex-OR, Ex-NOR Gate, Laws of Boolean algebra, De-Morgan's theorem, POS,SOP, Minterm, Maxterm and Karnaugh Maps (K-map) Activity 2: Game Pedegogy
Unit III	Combinational Logic circuits: Introduction, Half adder, Full adder, Half subtractor, Full subtractor circuit. Multiplexer and DE-multiplexer, Encoder & Decoder Activity 3: Technical Poster Presentation
Unit IV	Flip Flops: R-S Flip-Flop, J-K Flip-Flop, Master-Slave Flip-Flops, D Flip-Flop, J-K Flip-Flop as D Flip-Flop, T- Flip-Flop Activity 4: Mind Mapping
Unit V	Counter: Introduction, Asynchronous counter, Synchronous counter, Bushing, Type T Design, Ring counter & Johnson counter Shift Register: Introduction, parallel and shift register, Seven Segment displays. Activity 1: Story Board Writing/ Paper Presentation

Text Books

T.1	1.Electronic Devices and Circuits David A Bell
T.2	2.Digital Logic and Computer Design M.Morris Mano,PHI Learning.


Reference Books

R.1	Electronics Instrumentation and Measurements (3rdEdition)–David A. Bell.
R.2	Fundamental of digital circuits by A. ANAND KUMAR

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Useful Links	
1	https://nptel.ac.in/courses/122106025
2	https://nptel.ac.in/courses/108105132
3	https://nptel.ac.in/courses/117104072

CO	Course Outcome	CL	Class Session
CO1	Summarize the number system & its conversion	2	9
CO2	Interpret the truth table of Logic gates and simplify its logical expression	2	9
CO3	Implement combinational logic circuit by using half and full adder.	3	9
CO4	Illustrate the functional behavior of flip-flops	3	9
CO5	Apply the working principles of asynchronous and synchronous counters	3	9


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Department of Basic Sciences and Humanities

Program: B. Tech First Year (EE,ECE)

Semester-I	Indian Ancient Technology: BSH41204				
Teaching Scheme		Examination Scheme (Th)		Examination Scheme (P)	
Theory (Th)	2Hrs/week	CT-I	7 Marks	-	-
Practical(P)	-	CT-II	7 Marks	-	-
Total Credits	2 (Th)	CA	6 Marks	-	-
Duration of ESE: 2Hrs		ESE	30 Marks	-	-
		Total Marks	50 Marks	-	-

Pre-Requisites:

Course Objectives:

1.	To understand the foundational concepts and key developments in ancient Indian technology.
2.	To summarize ancient Indian innovations in metallurgy, architecture, agriculture, and medicine.
3.	To paraphrase the ecological and societal impact of these technologies and their relevance today.

Course Contents

Unit-I	Foundations of Indian Ancient Technology - Definition and scope, Sources: archaeological, literary (Vedas, epics, treatises), Chronological overview (Indus Valley to Gupta period and beyond)
	Activity 1: Group presentation on selected ancient technology or scientist. Activity 2: Quiz format with speed challenges.
Unit-II	Technological Innovations & Metallurgy: Wootz steel and its global influence, Iron Pillar of Delhi and corrosion resistance, Zinc smelting at Zawar mines, Bronze and copper tools in the Harappan civilization.
	Activity 1: Poster creation on sustainability in ancient Indian technology. Activity 2: Group discussion on Why did the Iron Pillar resist rust for over 1600 years?
Unit-III	Science, Medicine & Sustainability –Astronomy and ancient scientific instruments, Ayurveda and ancient surgical techniques, Ecological practices and sustainable technology, Revival and modern applications of ancient technology.
	Activity 1: Discussion on integrating traditional technologies in modern practices. Activity 2: Prepare a chart of Tridosha (Vata, Pitta, Kapha) and match herbs to body types.

Text Books :-

T.1	Aspects of Science and Technology in Ancient India Edited by Arun Kumar Jha and Seema Sahay
T.2	The Ancient Engineers by L. Sprague de Camp
T.3	The Golden Road: How Ancient India Transformed the World by William Dalrymple

Reference Books:-


R.1	"The Wonder That Was India" – A. L. Basham
R.2	"Iron and Steel in Ancient India" – B. R. Pant
R.3	"Indian Medicine in the Classical Age" - P. Kutumbiah

Useful Links:-

1.	https://onlinecourses.nptel.ac.in/noc20_ae10/preview
2.	https://archive.nptel.ac.in/courses/101/104/101104065/
3.	https://hits.digimat.in/nptel/courses/video/101104065/L08.html

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CO	Course Outcomes	CL	Class Sessions
CO1	State major ancient Indian technologies and their principles.	1	9
CO2	Describe the processes and applications of metallurgy, architecture, and agriculture in ancient India.	1	8
CO3	Explain the sustainability and modern relevance of ancient Indian technologies.	2	8


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**Department of Basic Sciences and Humanities****Program: B. Tech First Year (EE,ECE)****Semester-I IDEA-Lab & Engineering Workshop: BME41101**

Teaching Scheme		Examination Scheme(Th)		Examination Scheme(P)	
Theory (Th)	-	CT-I	-	-	-
Practical (P)	2 Hrs/week	CT-II	-	-	-
Total Credits	2 (P) = 1	CA	-	CA	25 Marks
-	-	ESE	-	ESE	25 Marks
		Total Marks	-	-	50 Marks

Course Objectives:

1. To understand different manufacturing processes which are commonly employed in the industry.
2. To give hands on training and practice to students for use of various tools, devices, equipment and machines.
3. To analyze different types of welding process with the help of welding simulation package

List of Experiment

1	Fitting: Use and setting of fitting tools for chipping, cutting, filing, marking, center punching, drilling and tapping. Job-1: Fitting to size, male-female fitting with drilling and tapping.	CO1
2	Carpentry: Use and setting of hand tools like hacksaws, jack planes, chisels and gauges for construction of various joints, wood tuning and modern wood turning methods. Job-2: L Joint / T Joint / Cross joint	CO2
3	Welding: Use and setting of tools and equipment for edge preparation for welding jobs and Arc welding for different job. Job-3: Lap welding of two plates / butt welding of plates.	CO3
4	Welding Simulation: introduction to welding, types of welding process, types of joints, materials, application of different types of welding. Job-4: Job on Simulation Package Software	CO4
5	Fasteners: Types of fastening process, Screw threads, nut & bolt. Demonstration of thread forming/machining and its measurement.	CO5

Text Books

T.1	“Elements of Workshop Technology”: Hajra Choudhury S.K., Hajra Choudhury A.K. and Nirjhar Roy S.K, 2008 and Vol. II 2010, Media promoters and publishers private limited, Mumbai.
T.2	“Manufacturing Technology – I”: Gowri P., Hariharan and A. Suresh Babu, Pearson Education, 2008.


Reference Books

R.1	“Process and Materials of Manufacture”: Roy A. and Lindberg, 4 th Edition, Prentice Hall India 1998.
R.2	“Elements of Workshop Technology”: S K Hajra, Choudhury, A K Hajra, Choudhury, & Nirjhar Roy, Vol. I & II.
R.3	“A Course in Workshop Technology”: B S Raghuwanshi, Vol. 1 & II.

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Useful Links	
1	https://nptel.ac.in/courses/112/103/112103305/
2	https://nptel.ac.in/courses/112/107/112107145/
3	https://nptel.ac.in/courses/112/107/112107144/
4	https://nptel.ac.in/courses/112/103/112103306/

CO	Course Outcomes	CL	Class Session
CO1	Identify marking tools, hand tools, measuring instruments and to work to prescribed dimensions/tolerances on mating of two metal parts.	1	4
CO2	Understand carpentry tools for wooden joints, Simple exercise using jack plane.	2	4
CO3	Apply the joint by Arc welding, Simple butt and Lap welded joints.	3	4
CO4	Demonstrate advance welding process on simulation package to obtain practical skills in the various trades.	3	4
CO5	Differentiate types of fasteners and evaluate their suitability for specific mechanical or structural uses.	4	4


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Department of Basic Sciences and Humanities

Program: B. Tech First Year (EE,ECE)

Semester-I	Environment Sustainability-Lab: BCE41102				
Teaching Scheme	Examination Scheme (Th)			Examination Scheme (P)	
Theory (Th)	-	-	-	-	-
Practical (P)	2 Hrs./week	-	-	-	-
Total Credits	1	-	-	IA	25 Marks
-	-	-	-	ESE	25 Marks
-	-	-	-	Total	50 Marks

Pre-Requisites: NA

Course Objectives:

1.	Develop skills to assess and manage water resources sustainably.
2.	Apply techniques to control soil erosion and waste recycling.
3.	Analyze environmental impacts of air and energy systems.
4.	Design sustainable infrastructure using permeable materials and green roofs.
5.	Evaluate carbon footprints and promote eco-friendly civil engineering practices.

Course Contents

Sr. No.	Name of Experiment	CO
1.	To assess the quality of water samples from different sources	CO1
2.	To construct and evaluate a small-scale rainwater harvesting system	CO1
3.	To study soil erosion and evaluate control measures	CO2
4.	To demonstrate the composting process for organic waste	CO2
5.	To measure air pollution levels in different locations	CO3
6.	To assess energy consumption in a classroom	CO3
7.	To evaluate water infiltration in permeable pavements	CO4
8.	To assess the recyclability of construction waste	CO4
9.	To estimate personal carbon footprints	CO5
10.	To evaluate the benefits of green roofs	CO5

Text Books

T.1	Peavy, H. S., Rowe, D. R., & Tchobanoglous, G. (2017). Environmental Engineering, McGraw-Hill Education
T.2	Davis, M. L., & Cornwell, D. A. (2014). Introduction to Environmental Engineering (5th ed.), McGraw- Hill Education
T.3	Masters, G. M., & Ela, W. P. (2014). Introduction to Environmental Engineering and Science (3rd ed.), Pearson
T.4	Sharma, H. D., & Reddy, K. R. (2004). Geoenvironmental Engineering: Site Remediation, Waste Containment, and Emerging Waste Management Technologies, Wiley
T.5	Newman, J., & Choo, B. S. (2003). Advanced Concrete Technology: Constituent Materials, Elsevier

Reference Books

R.1	Sachs, J. D., & Ban, K. (2015). The Age of Sustainable Development. Columbia University Press
R.2	Kubba, S. (2010). LEED Practices, Certification, and Accreditation Handbook. Elsevier

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R.3	Rittmann, B. E., & McCarty, P. L. (2001). Environmental Biotechnology: Principles and Applications. McGraw-Hill
R.4	LaGrega, M. D., Buckingham, P. L., & Evans, J. C. (1994). Hazardous Waste Management. McGraw-Hill
R.5	Thibodeaux, L. J. (1996). Environmental Chemodynamics: Movement of Chemicals in Air, Water, and Soil (2nd ed.). Wiley Interscience.

Useful Links

1	https://archive.nptel.ac.in/courses/127/105/127105018/
2	https://onlinecourses.nptel.ac.in/noc19_ce40/preview
3	https://archive.nptel.ac.in/courses/127/106/127106004/
4	https://onlinecourses.nptel.ac.in/noc19_ce32/preview
5	https://onlinecourses.nptel.ac.in/noc22_ch33/preview

CO	Course Outcomes	CL	Lab Session
CO1	Apply methods to assess water quality and design rainwater harvesting systems.	2	4
CO2	Implement erosion control and manage organic waste sustainably.	2	4
CO3	Evaluate air quality data and develop strategies to optimize classroom energy use.	3	4
CO4	Assess permeable pavements and formulate plans for recycling construction waste.	3	4
CO5	Analyze carbon footprints and design green roof models for environmental benefits.	3	4



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Department of Basic Sciences and Humanities

Program: B. Tech First Year (EE,ECE)

Semester-I	Fundamentals of Computer-Lab: BCS41104				
Teaching Scheme		Examination Scheme (Th)		Examination Scheme (P)	
Theory (Th)	-	CT-I	-	-	-
Practical (P)	4 Hrs/week	CT-II	-	-	-
Total Credits	2(P)	CA	-	-	25 Marks
Duration of ESE: 2Hrs		ESE	-	-	25 Marks
		Total Marks	-	-	50 Marks

Pre-Requisites:

Course Objectives:

1.	To understand the foundational concepts and key developments in ancient Indian technology.
2.	To summarize ancient Indian innovations in metallurgy, architecture, agriculture, and medicine.
3.	To paraphrase the ecological and societal impact of these technologies and their relevance today.

Course Contents

Unit-I	Introduction to Computer: - Characteristics of Computers, Basic Applications of Computer, Classifications of Computers: Representation of data/Information concepts of data processing, Definition of Information and data, Basic data types Storage of data/Information as files Components of Computer System: Central Processing Unit (CPU), VDU, Keyboard and Mouse, Other input/output Devices, Computer Memory, Concepts of Hardware and Software
Unit-II	Introduction to Operating System: - Overview of Operating System, Booting Process of Operating System, Functions or Tasks of the Operating System, I/O Management, Data Management, Memory Management, Device Management PC Troubleshooting, Maintenance and Tools: - Preventive Maintenance: Active, Passive, periodic maintenance procedure, Preventive maintenance of peripherals of PCs. Fault finding and troubleshooting of the above peripherals, Diagnostic software
Unit-III	Introduction of TCP/IP: - Characteristics of TCP/IP, TCP/IP Layers, Application/Uses of TCP/IP, Introduction of LAN, WAN and MAN Microsoft Office Installation and Document Formatting:- Microsoft Office Installation, Introduction to Microsoft Word/Excel/Power Point Presentation, Document Formatting and Styling, Advanced Word Features

Text Books :-

T.1	Fundamentals of Computers, V. Rajaraman, PHI Learning Pvt. Ltd., 6 th Edition.
T.2	Computer Fundamentals, P.K. Sinha & Priti Sinha, BPB Publication, 6 th Revised Edition

Reference Books:-


R.1	Introduction to Computers, Peter Norton, McGraw-Hill Education, 7 th Edition.
R.2	Computer fundamentals, Anita Goel, Pearson Education, 1 st Edition.
R.3	Information Technology: Principles and Applications, A.K. Sharma, University Science Press(Laxmi publications), Latest Edition

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Useful Links:-	
1.	https://youtu.be/eEo_aacpwCw
2.	https://youtu.be/dOiA2nNJpc0
3.	https://youtu.be/gxsFmFU4aI0

Sr. No.	List of Experiment	
1	To identify the computer hardware parts Procedure.	CO1
2	Assembling and disassembling the system hardware components of the personal computer Requirements: 1. CPU (Processor) 2. Mother Board 3. Floppy Disk Drive Monitor 4. Cabinet 5. Speaker 6. Key Board 7. Mouse 8. Bus Cables 9. RAM (SD or DDR) 10. Hard Disk Drive 11. Power 12. SMPS 13. Monitor 14. Screw 15. Printer 16. CD or DVD ROM Cables Driver	CO1
3	The installation steps for the Windows operating system. Requirement: 1. Operating System CD 2. Computer	CO1
4	The installation steps for the Linux operating system. Requirement: 1. Operating System CD 2. Computer	CO2
5	To facilitate a software troubleshooting exercise, students will be provided with a malfunctioning CPU afflicted by system software issues. Their task will be to diagnose and resolve the problem to restore the computer to working condition.	CO2
6	To learn about Local Area Networks and Internet access, students will configure the TCP/IP settings. In the final step, students should demonstrate to the instructor how to access websites and email	CO2
7	To learn about various internet threats and configure their computer to be secure while online.	CO2
8	Installation MS Office Apply different alignments, correct formats in MS-Word, Excel and Power Point Presentation.	CO3
9	Create a Visiting Card of your college using page size as follows • Page width="3.2" • Page height="2" And use different font styles, sizes, alignments, and apply printed water mark on the paper.	CO3
10	Create a mail merge to call 10 members for an interview.	CO3

CO	Course Outcomes	CL	Class Session
CO1	Understand and explain the basic structure, components, and functioning of a computer system.	2	4
CO2	Demonstrate knowledge of operating system functions, data storage, and perform basic troubleshooting and maintenance of PCs.	3	4
CO3	Apply the uses of Microsoft Office tools (Word, Excel, PowerPoint) for document creation, formatting, and presentation.	3	4


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**Department of Basic Sciences and Humanities****Program: B. Tech First Year (EE,ECE)****Semester-I Social Internship (BSH41205)**

Teaching Scheme		Examination Scheme (Th)		Examination Scheme(P)	
Practical (P)	-	Internal	50 Marks	-	-
-	-	-	-	-	-
Total Credits	1(Pr) = 2	-	-	-	-
Duration of ESE:2Hrs		Report Submission	50 Marks	-	-
		Total Marks	50 Marks	-	-

Pre-Requisites: NA**Course Objectives:**

1. To Develop a sense of responsibility and empathy toward community welfare and social issues.
2. To motivate students to contribute time, skills, and effort to NGOs, rural development programs.
3. To align student efforts with national development goals like health, education, environment.

Course Contents

Unit I	Introduction of Social Responsibility and community Collaboration: Introduction, Types and Understanding of Social Responsibility. Understand community and diversity and introduction and types of social issues and its challenges to overcome. Activity: Draw the chart of Various Social issues in Daily life
Unit II	Introduction of Social Organization and initiatives: Introduction of Social Organization and its Types, Introduction of social program and scheme, role and responsibility of volunteers and intern. Essential Skill for social engagement, Social Organization collaboration and confirmation. Activity: Identification and planning for Internship with organization.
Unit III	Practical Implementation & reflection of Social Internship: Process and Observation of Internship, Report and Workbook writing on basis of routine activity and reflection of learning, submission of detail report on Social internship along with outcome. Activity: Submission of Detail Internship Report and its Outcome.

Text Books

T.1	Social Welfare Administration in India, Sachdeva D.R. Kitab Mahal 2 nd Edition.
T.2	<i>Social Problems in India</i> , Ram Ahuja, Rawat Publications 3 rd Edition.

Reference Books

R.1	Contemporary Social Problems in India, G.R. Madan, Allied Publishers
R.2	Fieldwork Training in Social Work, Sanjoy Roy, Rawat Publications

Useful Links

1	https://www.youtube.com/watch?v=Xz_TLJmatGc
2	https://www.youtube.com/watch?v=Xz_TLJmatGc

CO	Course Outcome	CL	Lab Sessions
CO1	Understand the concept of Social Responsibility and Community Collaboration.	2	4
CO2	Implement and document the Social Internship process.	3	4
CO3	Apply essential skills for social engagement and internship planning.	3	4

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Department of Basic Sciences and Humanities

Program: B. Tech First Year (EE,ECE)

Semester-I **Digital Circuits and Design (BEC41101)**

Teaching Scheme		Examination Scheme(Th)		Examination Scheme(P)	
Theory (Th)	-	CT-I	-	-	-
Practical (P)	2Hrs/week	CT-II	-	-	-
Total Credits	3(Th)+1(P)=4	CA	-	CA	25Marks
Duration of ESE:3Hrs		ESE	-	ESE	25Marks
				-	50Marks

Pre-Requisites: Bridge Course

Course Objectives:

1.	To understand different number systems such as Binary, Decimal, Octal, and Hexadecimal.
2.	To develop and analyze logical expressions and circuits using logic gates, Boolean algebra, and Karnaugh Maps.
3.	To impart knowledge of fundamental combinational logic circuits such as adders, subtractors, multiplexers, encoders, and decoders.
4.	To understand the working principles and types of flip-flops used in sequential circuit design and their role in memory elements.
5.	To introduce various types of counters and shift registers, and their application in digital timing and display systems.

Course Contents

Unit I	Number system: Binary, Decimal, Octal & Hexadecimal, Conversion of one number system to another, BCD number system, Addition & Subtraction of Binary number system, 1's complement, 2's Complement
	Activity 1: MCQ Test/ Digital Number System Conversion Race
Unit II	Logic Gates: Symbol & truth table of AND gate, OR gate, NOT gate, NAND gate, NOR gate, Ex-OR, Ex-NOR Gate, Laws of Boolean algebra, De-Morgan's theorem, POS, SOP, Minterm, Maxterm and Karnaugh Maps (K-map)
	Activity 2: Game Pedegogy
Unit III	Combinational Logic circuits: Introduction, Half adder, Full adder, Half subtractor, Full subtractor circuit. Multiplexer and DE-multiplexer, Encoder & Decoder
	Activity 3: Technical Poster Presentation
Unit IV	Flip Flops: R-S Flip-Flop, J-K Flip-Flop, Master-Slave Flip-Flops, D Flip-Flop, J-K Flip-Flop as D Flip-Flop, T-Flip-Flop
	Activity 4: Mind Mapping
Unit V	Counter: Introduction, Asynchronous counter, Synchronous counter, Bushing, Type T Design, Ring counter & Johnson counter
	Shift Register: Introduction, parallel and shift register, Seven Segment displays.
	Activity 1: Story Board Writing/ Paper Presentation

Text Books

T.1	1.Electronic Devices and Circuits David A Bell
T.2	2.Digital Logic and Computer Design M.Morris Mano, PHI Learning.

Reference Books

R.1	Electronics Instrumentation and Measurements (3rdEdition)–David A. Bell.
R.2	Fundamental of digital circuits by A. ANAND KUMAR


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Useful Links	
1	https://nptel.ac.in/courses/122106025
2	https://nptel.ac.in/courses/108105132
3	https://nptel.ac.in/courses/117104072

Sr. No.	List of Experiment (BEC41102)	CO
1	Design different logic gates and verify its truth table.	CO1
2	Design universal gates and verify its truth table.	CO1
3	Design Half Adder and Full Adder and verify its truth table.	CO2
4	Design Half Subtractor and Full Subtractor and verify its truth table.	CO2
5	Verify proof of De-Morgan's theorem Boolean algebra with its truth table	CO3
6	Design 4:1 multiplexer and 1:4 Demultiplexer. and verify its truth table.	CO3
7	Design 8:3 Encoder & 3:8 Decoder logic circuit and verify its truth table.	CO4
8	Design different Flip-flops and verify its truth table..	CO4
9	Design of 3 bit synchronous counter and verify its truth table.	CO5
10	Design of shift register and shift register counter and verify its truth table.	CO5

Text Books	
T.1	A Text Book of Modern Digital Electronics by R. P. Jain: McGraw Hill
T.2	Digital Electronics: Principles, Devices and Applications by Anil K. Maini, McGraw Hill
Reference Books	
R.1	E. Hughes, "Electrical and Electronics Technology", Pearson, 2023.
R.2	Digital Logic and Computer Design by M. Morris Mano: Pearson

CO	Course Outcome	CL	Class Session
CO1	Summarize the number system & its conversion	2	4
CO2	Interpret the truth table of Logic gates and simplify its logical expression	2	4
CO3	Implement combinational logic circuit by using half and full adder.	3	4
CO4	Illustrate the functional behavior of flip-flops	3	4
CO5	Apply the working principles of asynchronous and synchronous counters	3	4


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Department of Basic Sciences and Humanities

Program: B. Tech First Year (EE,ECE)

Semester-II Differential Equation & statistics: (BSH41201)

Teaching Scheme		Examination Scheme (Th)		Examination Scheme(P)	
Theory (Th)	4 Hrs/week	CT-I	15 Marks	-	-
Practical (P)	-	CT-II	15 Marks	-	-
Total Credits	4 (Th) = 4	CA	10 Marks	-	-
Duration of ESE:3Hrs		ESE	60 Marks	-	-
		Total Marks	100 Marks	-	-

Pre-Requisites: NA

Course Objectives:

1	To utilize consistency of system of equations.
2	To make students acquainted with advance techniques to evaluate integrals.
3	To Identify the type of a given differential equation and select and apply the appropriate analytical Technique for finding the solution of first order and selected higher order ordinary differential equations.
4	To gain Statistical knowledge that helps to use the proper methods to collect the data, employ the Correct analyses and find the result.
5	To introduce students to Discrete and Continuous Random Variables concepts and their use in real world phenomena.

Course Contents

Unit I	Differential Equation: Order and Degree of D.E, Linear and Exact Differential Equations, First order & First degree D.E. solvable for p, Equations solvable for y, Equations solvable for x, Application : Newton's law of cooling, Data Analysis through Programming.
	Activity 1. Mathematically Verification of Newton's law of Cooling Practically. Activity 2. To solve Linear Differential Equation by Sagemath.
Unit II	Higher Order Differential Equation: Higher order linear D.E. with constant coefficient, Method of variations of Parameters, Cauchy's form, Legendre's Linear Equations. Application of second order differential equation to R-L-C CIRCUIT, Heat Equations.
	Activity 1. Perform basic operations of Differential equation by Sagemath. Activity 2. To solve higher Order Differential Equation by using Sagemath
Unit III	Multivariable Calculus (Integration): Double Integration (Cartesian and polar coordinates), Change of Order of Integration, Elementary Triple Integration, And Application: Area by double integration and volume by triple integration.
	Activity 1. Application of integration by using Sagemath Activity 2. Evaluation of Integration by using Sagemath.
Unit IV	Probability: Conditional Probability, Discrete Random Variable, Continuous Random Variable, Probability Distribution function, Probability density function, Binomial Distribution, Uniform Distribution, Poisson's Theorem, Moment Generating Function (Discrete random Variable and Continuous Random variable).
	Activity 1. Mathematical model based on Probability. Activity 2. To Evaluate Random variable by using Sagemath.

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Unit V	Statistics: Measures of central tendency: Skewness and Kurtosis, Coefficient of variation, Moments, Fitting of straight line, Fitting of parabola and exponential curves, Lines of regression and correlation, Rank correlation.
	Activity 1. To Determine mean, mode & median by sagemath.
	Activity 2. To Fit the straight line , Parabola and Exponential curves by using Scilab.
Text Books	
T.1	Higher Engineering Mathematics by Bali Lyenger (Laxmi Prakashan) 9 th Edition
T.2	Advance Engineering Mathematics by Ervin Kreyszig's 9 th Edition
T.3	H. K. Dass, Advanced Engineering Mathematics, S. Chand, Reprint, 2014.
T.4	Outline Series, McGraw Hills, 4th Edition, 2016.
T.5	P.N.Wartikar and J.N.Wartikar, Applied Mathematics, 4th Edition, Vidyarthi GrihaPrakashan.
T.6	GB Thomas and R.L. Finney, Calculus and Analytic geometry 9 th edition, Pearson, Reprint2002.
Reference Books	
R.1	Gilbert Strang: Linear Algebra and Its Applications (Paperback), Nelson Engineering (2007)
R.2	“Advanced Engineering Mathematics” by Erwin Kreyszig's (Wiley India) 9 th edition
R.3	A textbook of Engineering Mathematics by N.P. Bali, Manish Goyal, Laxmi Publication, Reprint 2010
R.4	Higher Engineering Mathematics by B. S. Grewal, Khanna Publisher 35 th edition.
Useful Links	
1	https://onlinecourses.nptel.ac.in/noc23_ma61/preview
2	https://onlinecourses.nptel.ac.in/noc21_ma74/preview
3	https://archive.nptel.ac.in/courses/111/107/111107108/

CO	Course Outcomes	CL	Class Sessions
CO1	Use appropriate methods to solve first order differential equation and apply it to find solution of engineering problems.	3	9
CO2	Apply appropriate methods to solve higher order differential equation	3	9
CO3	Utilize fundamental theorems to compute integrals of both single-variable and multivariable functions.	3	9
CO4	Apply Probability concepts to interpret real-world Phenomena.	3	9
CO5	Inspect scientific data, use proper curve fitting and find correlation, regression of variables.	3	9



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Department of Basic Sciences and Humanities

Program: B. Tech First Year (EE,ECE)

Semester-II **Semiconductor Physics & Optics: (BSH41207)**

Teaching Scheme		Examination Scheme (Th)		Examination Scheme(P)	
Theory (Th)	3Hrs/week	CT-I	15 Marks	-	-
Practical(P)	2Hrs/week	CT-II	15 Marks	-	-
Total Credits	3(Th)+1(P)=4	CA	10 Marks	CA	25 Marks
Duration of ESE:3Hrs			60 Marks	ESE	25 Marks
		Total Marks	100 Marks	-	50 Marks

Pre-Requisites: AICTE Bridge Course, Basics of Physics.

Course Objectives:

1.	To analyze the concept of cut in voltage, voltage regulator and current gain in PN junction diode, Zener diode and transistor respectively. To show the strong conceptual understanding of Crystallography with their types and application in various engineering field.
2.	To interpret the motion of charged particle in electric field, magnetic field and cross configured field through Bethe's law, Cathode ray tube (CRT) and Cathode ray Oscilloscope (CRO).
3.	To show the strong conceptual understanding of Crystal structure with their types and application in various engineering field.
4.	To compare the interference of waves in parallel thin film, wedge shaped thin film and their application in engineering field.
5.	To explain the Phenomenon, properties of optical fiber with their application in engineering field.

Course Contents

Unit I	Semiconductor Physics :Introduction, Intrinsic semi conductors and Extrinsic Semi conductor, PN-Junction diode, Hall effect & voltage, Hall coefficient, its application, Zener diode, LED, Transistor (CB, CC& CE mode) Activity 1: Circuit model making of P N Junction Diode/ light emitting diode/ Zener diode/Transistor Activity 2: Case Study on Semiconductor Material Application
Unit II	Electron Ballistics & Electron Optics: Introduction of electric and magnetic field, Uniform Electric Field parallel to electron motion, Uniform Electric Field perpendicular to electron motion, Uniform Magnetic Field parallel to electron motion, Uniform Magnetic Field perpendicular to electron motion, Electric and Magnetic fields in cross configuration, Bethe's law, Devices: Cathode Ray tube, CRO, Block Diagram, Function & working of each block. Activity 1: Game Pedagogy - Crossword Puzzle of Electron Ballistics & Electron Optics. Activity 2:Poster Presentation
Unit III	Crystal Structure: Introduction, Classification of Crystal structure, Simple Cubic cell, Body Centered cubic cell, Face Centered cubic cell (SC, BCC, FCC), Elements of crystal, Unit cell and their types. Characteristics of Unit cell, Effective number of atoms per unit cell, atomic radius, nearest neighbor distance, coordination number, atomic packing factor, void space, density; Crystallographic planes and Miller indices, Bragg's law of diffraction and its equation. Activity 1: Model making of different structure(SC,BCC,FCC) Activity 2: Open Book Test
Unit IV	Wave Optics: Introduction, thin film, Plane Parallel thin film, Wedge shaped thin film, Newton rings and its application, Antireflection coating. Activity 1: PPT on classification of Parallel thin film and Wedge-shaped thin film with their application. Activity 2:Preparation of Video clips

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Unit V	Optical Fiber: Propagation of light by total internal reflection, structure and classification (based on material, refractive index and number of modes), Modes of propagation in fiber, Acceptance angle, Numerical aperture, Attenuation and dispersion. Applications of Optical fiber. Activity 1: Context based learning & document making based activity. Activity 2: Multiple choice questions on Optical Fiber.
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Text Books

T.1	Avadhanulu, M.N., & Kshirsagar, P.G. (8th Revised Edition). A Textbook of Engineering Physics. S. Chand Publication. New Delhi.
T.2	Subrahmanyam, N., Brij Lal, & Avadhanulu, M.N. (23rd Revised and Enlarged Edition, 2006). A Textbook of Optics. S. Chand Publication. New Delhi.
T.3	Mehta, V.K., & Mehta, Rohit. (Multicolour Illustrative and Thoroughly Revised Tenth Edition, 2006). Principles of Electronics. S. Chand Publication. New Delhi.

Reference Books

R.1	Theraja, B.L. (Reprint 2nd Edition). Modern Physics. S. Chand & Co. New Delhi.
R.2	Dekker, J. (Reprint 1st Edition). Solid State Physics. McMillan India Ltd. Mumbai.

Useful Links

1	https://nptel.ac.in/courses/115/102/115102124/
2	https://nptel.ac.in/courses/115/106/115106128/
3	https://nptel.ac.in/courses/104/101/104101130/

LIST OF EXPERIMENTS (Semiconductor Physics & optics lab-BSH41208)

1	Determination of lattice constant and atomic packing fraction of simple cubic structure.	CO1
2	Determination of e/m ratio of an electron by Thomson method.	CO2
3	Determine the Cut in Voltage and Dynamic Resistance of P-N Junction Diode in Forward and Reverse Biased.	CO3
4	Determine the Break Down Voltage and Dynamic Resistance of Zener Diode	CO3
5	Determine the ripple factor and rectification efficiency by Half Wave and Full Wave Rectifier using CRO.	CO3
6	Determination of Dynamic Resistance and Current Gain of Transistor in Common Base Mode..	CO3
7	Determination of Dynamic Resistance and Current Gain of Transistor in Common Emitter	CO3
8	Calculate the Wavelength of Sodium Light By Using Newton rings experiment.	CO4
9	Determination of Fringe width by using Wedge shaped thin film.	CO4
10	Determination of divergence of laser beam.	CO5

Text Books

T.1	Experiments in Engineering Physics: M.N. Avadhanulu, A.A. Dani, 2 nd Edition S. Chand (G/L) & Company Ltd, New Delhi.
T.2	A textbook of Practical Physics: Samir Kumar Ghosh, 1 st Edition, New Central Book Agency, Kolkata.

Reference Books

R.1	Engineering Physics: Dattu Joshi, Tata Mc Graw Hill Education, New Delhi.
R.2	A text book of Engineering physics: Dr. M.N. Avadhanulu, Dr. P.G. Kshirsagar, S. Chand Publication.

Useful Links

1	https://nptel.ac.in/courses/115/106/115106128/
2	https://nptel.ac.in/courses/104/101/104101130/



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CO	Course Outcomes	CL	Class Sessions
CO1	Interpret the Crystal geometry, the behavior of solids and different characteristics of cubic crystal structure.	3	9
CO2	Illustrate the concept of motion of charged particle in electric field, magnetic field and cross configured field.	3	9
CO3	Explain p n junction diode, Zener diode ,Light emitting diode and transistor with their application in engineering field.	4	9
CO4	Analyze the concept of interference in parallel and wedge shaped thin film and their application in engineering field.	4	9
CO5	Explain the characteristics of laser, optical fiber and their application in engineering.	4	9



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**Department of Basic Sciences and Humanities****Program: B. Tech First Year (EE,ECE)****Semester-II Principle of Electrical Engineering: (BEE41201)**

Teaching Scheme		Examination Scheme (Th)		Examination Scheme(P)	
Theory (Th)	3Hrs/week	CT-I	15 Marks	-	-
Practical (P)	2Hrs/week	CT-II	15 Marks	-	-
Total Credits	3(Th)+1(P) = 4	CA	10 Marks	CA	25Marks
Duration of ESE:3Hrs		ESE	60 Marks	ESE	25Marks
		Total Marks	100Marks	-	50Marks

Pre-Requisites: NA.**Course Objectives:**

1.	To understand and analyze basic electric and magnetic circuits.
2.	To study the working principles of electrical machines and power converters.
3.	To introduce the components of low-voltage electrical installations.

Course Contents

Unit I	Electrical circuit elements (R, L and C), voltage and current sources, Kirchhoff current and voltage laws, analysis of simple circuits with dc excitation Superposition Theorem.
Unit II	Representation of sinusoidal waveforms, peak and RMS values, phasor representation, real power, reactive power, apparent power, power factor. Analysis of single-phase ac circuits consisting of R, L, C, RL, RC, RLC combinations (series and parallel), resonance. Three-phase balanced circuits, voltage and current relations in star and delta connections
Unit III	Magnetic materials, BH characteristics, series and parallel magnetic circuits, ideal and practical transformer, equivalent circuit, losses in transformers, regulation and efficiency. Autotransformer and three-phase transformer connection
Unit IV	Introduction to Power Generation Thermal Hydro, Nuclear, Wind, Solar with Block Schematic Presentation Only. Single line diagram for Generation Transmission, Distribution through different Voltage levels. Low voltage distribution system Overhead Underground Single Phase Three Phase. Basic operation of UPS Invertors Block schematic representation.
Unit V	Protective Devices: Switch Fuse Unit (SFU), MCB, ELCB, MCCB, Types of Wires and Cables, Earthing. Types of Batteries, Important Characteristics for Batteries. Elementary calculations for energy consumption, power factor improvement and battery backup. Illuminance: Lamps- fluorescent, CFL, LED. Electrical measuring instruments principle and applications energy meter, megger, tong tester.

Text Books

T.1	D. P. Kothari and I. J. Nagrath, "Basic Electrical Engineering", Tata McGraw Hill, 2010.
T.2	D. C. Kulshreshtha, "Basic Electrical Engineering", McGraw Hill, 2009.
T.3	L. S. Bobrow, "Fundamentals of Electrical Engineering", Oxford University Press, 2011.

Reference Books

R.1	E. Hughes, "Electrical and Electronics Technology", Pearson, 2010.
R.2	Vincent Del Toro, "Electrical Engineering Fundamentals", Prentice Hall India, 1989

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Useful Links	
1	https://digimat.in/nptel/courses/video/108105112/L01.html
2	https://archive.nptel.ac.in/courses/108/105/108105112/
3	https://archive.nptel.ac.in/courses/108/105/108105053/

LIST OF EXPERIMENTS(Principle of Electrical Engineering Lab: BEE41202)		
1	Verification of Kirchhoff's laws (KVL & KCL) for given network.	CO1
2	Verification of Superposition theorem for given network.	CO2
3	Determination of resistance and inductance of choke coil	CO2
4	Execute RLC series circuit operation and to plot Phasor diagram for it.	CO3
5	Determination of Permeability & Saturation point for given magnetic material	CO3
6	Detection of core losses and copper losses by performing open circuit test and short circuit test on single phase transformer	CO3
7	Perform direct loading test on single-phase transformer to determine its efficiency & voltage regulation.	CO3
8	Investigate the performance and efficiency of a UPS and an inverter in providing backup power during utility power interruptions.	CO4
9	Explore the construction and working principles of a separately excited DC motor, including the role of field windings and armature.	CO4
10	Explore the principles of insulation resistance measurement with a megger and clamp-on current measurement with a tong tester.	CO5

Text Books

T.1	A Text Book of Electrical Technology: B. L. Thareja and A. K. Thareja, S. Chand Publication (Volume I, II & III). 2011
T.2	Rashid M.H, "Power Electronics: Circuits Devices and Applications", 3rd Edition, Pearson, 2011.


Reference Books

R.1	E. Hughes, "Electrical and Electronics Technology", Pearson, 2010.
R.2	D. C. Kulshreshtha, "Basic Electrical Engineering", McGraw Hill, 2009.

Useful Links

1	https://nptel.ac.in/courses/117/106/117106034/
2	https://nptel.ac.in/courses/108108076/
3	https://nptel.ac.in/courses/108105062/

CO	Course Outcomes	CL	Class Sessions
CO 1	Describe Kirchhoff's current and voltage laws to analyze and solve complex DC electrical circuits.	2	9
CO 2	Interpret single-phase and three-phase AC circuits, calculate power parameters, and make informed decisions regarding their applications.	2	9
CO 3	Illustrate and optimizing transformers and magnetic circuits with a focus on factors such as material characteristics, losses, and connection configurations.	3	9
CO 4	Construct various electric machines, including three-phase induction motors, separately excited DC motors, and synchronous generators.	3	9
CO 5	Analyze the types of wires and cables commonly used in electrical installations, considering their specifications and applications.	4	9


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Department of Basic Sciences and Humanities

Program: B.Tech First Year (EE/ECE)

Semester-II **Engineering & Computer Graphics: BME41202**

Teaching Scheme		Examination Scheme(Th)		Examination Scheme(P)	
Theory(Th)	2 Hrs/week	CT-I	07 Marks	-	-
Practical (P)	-	CT-II	08 Marks	-	-
Total Credits	2 (Th)= 2	CA	05 Marks	-	-
Duration of ESE:3 Hrs		ESE	30 Marks	-	-
		Total Marks	50 Marks	-	-

Pre-Requisites: Basics of drawing such as dimensions, scale, angle, projection

Course Objectives:


1	To apply fundamental engineering drawing conventions, including BIS standards, line types, and dimensioning techniques, and construct various engineering curves to solve practical problems.
2	To analyze and generate orthographic projections of points, lines, planes, and basic solids in first-angle projection, demonstrating an understanding of spatial relationships.
3	To Create orthographic and sectional views of machine parts and convert them into accurate isometric drawings.

Unit I	<p>Fundamentals of Engineering Drawing & Curves: Introduction to Engineering Drawing: Importance and scope in engineering disciplines, Introduction to BIS (Bureau of Indian Standards) drawing conventions, Drawing Instruments and Sheet Layout: Types and uses of drawing instruments (drawing board, T-square, set squares, compass, dividers, etc.), Standard sheet sizes (A-series), sheet layout, title block</p> <p>Types of Lines and Dimensioning:</p> <p>Classification of lines as per BIS – visible, hidden, center, construction, and section lines</p> <p>Methods and conventions of dimensioning – unidirectional and aligned methods</p> <p>Engineering Curves:</p> <p>Construction and applications of conic sections: Ellipse, Parabola, Hyperbola</p> <p>Special curves: Cycloid, Involute (of a circle), Logarithmic Spiral and Archimedean Spiral</p> <p>Practical applications of curves in engineering components</p> <p>Activity 1: Hands-on sketching exercise—constructing different types of lines and applying dimensioning standards on practice templates.</p> <p>Activity 2: Problem-solving session—construction of various engineering curves using geometrical methods and templates.</p>
Unit II	<p>Principles of Orthographic Projection:</p> <p>Theory and terminology of projection, First angle vs. third angle projection methods (emphasis on first angle), Projection of Points and Lines: Projections of points located in different quadrants, Projections of lines inclined to one or both reference planes (horizontal and vertical planes), Projection of Planes: Projection of plane figures (circle, triangle, square, rectangle, pentagon, hexagon, etc.) inclined to both H.P. and V.P.</p> <p>Projection of Solids:</p> <p>Projection of standard 3D solids (cube, prism, pyramid, cylinder, cone)</p> <p>Axis inclined to one reference plane and parallel to the other</p>

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	Activity 1: Group activity—projection of a line and plane with various inclinations using AutoCAD or manual drafting. Activity 2: Visualization quiz—identifying true length, angle, and shape from given orthographic views.
Unit III	Orthographic Projections of Machine Components: Generation of multiview (front, top, side) orthographic drawings from pictorial representations, Use of first angle projection method, Application of sectional views for clarity in representation Isometric Drawing: Understanding isometric axes and planes, Creation and use of the isometric scale, Conversion of orthographic views into isometric views or projections, Interpretation of 2D technical drawings into 3D representations Activity 1: Lab session—generation of multiview orthographic projections of simple machine components using manual drafting and then replicating in CAD software. Activity 2: Practical exercise—Development of isometric views from given orthographic projections using isometric grid paper and CAD tools.
Textbooks	
T.1	Elementary Engineering Drawing - N.D. Bhatt, Charotar Publishing house, Anand, India.
T.2	Engineering Drawing - D. A. Johle, 1 st Edition, 2017, Tata McGraw-Hill Publishing Co. Ltd.
T.3	Engineering Graphics with an introduction to AUTOCAD - A. R. Bapat, 6th reprint Edition, 2012, Allied Publishers, New Delhi.
T.4	Engineering Graphics with AutoCAD - D. M. Kulkarni, A. P. Rastogi, A. K. Sarkar, Revised Edition, 2010, PHI Publication.
T.5	Engineering Drawing - R.K. Dhawan, 1st Edition, 2012, S Chand Publications
T.6	Engineering Drawing, M.B. Shah, B.C. Rana, 2nd Edition, 2009, Pearson Publication
Reference Books	
R.1	Engineering Graphics by P.J.Shah, Revised edition 2014, S Chand and Company ltd., New Delhi, India.
R.2	Engineering Drawing by Basant Agarwal and C.M. Agarwal, 2 nd edition 2015, Tata Magraw Hill Publication Company ltd., and New Delhi, India.
R.3	Fundamentals of Engineering Drawing - Luzadder Warren J, Duff John, 11th Edition, 2012, PHI Publications.
R.4	Machine Drawing -N.D. Bhatt, 46 th Edition, 2014, Charotar Publishing house, Anand, India.
Useful Links	
1	https://nptel.ac.in/courses/112/103/112103019
2	https://nptel.ac.in/courses/112/102/112102304/
3	https://nptel.ac.in/courses/112/105/112105294/

CO	Course Outcomes	CL	Class Sessions
CO1	Apply BIS standards and drafting techniques to construct technical drawings and engineering curves using appropriate instruments.	3	8
CO2	Analyze and produce orthographic projections of points, lines, planes, and solids based on their spatial orientation with reference planes.	4	8
CO3	Categorize multiview orthographic and isometric drawings of simple machine components by interpreting 2D and 3D views using manual or CAD tools.	4	9


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**Department of Basic Sciences and Humanities****Program: B. Tech First Year (EE,ECE)****Semester-II C Language Lab (BIT41205)**

Teaching Scheme		Examination Scheme	
Practical	2 Hrs/week	CT-1	-
Tutorial	-	CT-2	-
Total Credits	1	CA	25 Marks
		ESE	25 Marks
		Total	50 Marks
		Duration of ESE:	-

Course Objective:

1	To understand C language fundamentals and represent solutions using algorithms and flowcharts.
2	To apply operators and expressions to perform logical and arithmetic operations in C.
3	To Write and execute C programs using control structures and standard I/O functions.

Course Contents

Unit I	Introduction to C: History of C, Features of C, Structure of C program, Character Set, C Tokens-Key words, Identifiers, Constants, Variables, data types, Operators, variable declaration, Assigning Value to variable, Introduction to Computing: Algorithm, Flowchart, Representation of Algorithm and Flowchart with examples.
Unit II	Operator and Expression: Arithmetic, Relational, Logical, Assignment, Increment and Decrement, Conditional operator, Bitwise operators, sizeof operator, Arithmetic Expression, Evaluation expression. Programming Basics: Components of C language. Standard I/O in C, Format Specifies, Writing and executing C program, Syntax and logical errors in compilation, object and executable code.
Unit III	Statements-Selection statements (Decision Making): IF, IF-ELSE, Nested IF-ELSE and switch statements with examples, Repetition statements (loops)- while, for, do-while statements with examples, Unconditional statements- break, continue, goto statements with examples.

Text Books

1	Computer Programming with C, Special Edition-MRCET, Mc Graw Hill Publishers 2017.
2	Computer Science: A Structured Programming Approach Using C, B.A.Forouzan and R.F. Gilberg, Third Edition, Cengage Learning.

Reference Books

1	Let us C , Yashwanth Kanethkar, 13th Edition, BPB Publications.
2	Computer Programming, E. Balagurusamy, First Edition, TMH.
3	The C Programming Language, B.W. Kernighan and Dennis M. Ritchie, PHI.

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Useful Links	
1	https://youtu.be/-wv-OERJK3M
2	https://youtu.be/IdXrCPzNnkU
3	https://youtu.be/5AHRXOtn9bY

Sr. No.	List of Experiment	
1	Design a program to calculate simple interest(SI) for a given principal (P), time (T), and rate of interest (R) ($SI = P \cdot T \cdot R / 100$)	CO1
2	Write a program that declares Class awarded for a given percentage of marks, where mark <40%= Failed, 40% to <60% = Second class, 60% to <70%=First class, >= 70% = Distinction. Read percentage from standard input.	CO1
3	C program to read roll number and marks from user and display it on screen.	CO1
4	Implement computational problems using arithmetic expressions	CO2
5	C program to print 1 to 10 numbers using for loop.	CO2
6	C Program to check Armstrong number using while loop	CO3
7	Program to find greatest among 3 numbers using decision making statement	CO3
8	Write a C program to construct a pyramid of numbers as follows (using Looing Concept) a) 1 b) * 2 2 * * 3 3 3 * * * 4 4 4 4 * * * *	CO3
9	Implement Problems involving if-then-else structures	CO3
10	Micro Project	CO3

CO	Course Outcomes	CL	Class Session
CO1	Understand the problem and build an algorithm/flowchart to solve it	2	4
CO2	Illustrate basic structure of C also perform the compilation execution process.	3	4
CO3	Execute the C code to perform the operation using the decision making statement	3	4


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Department of Basic Sciences and Humanities

Program: B.Tech First Year (AE/CE/ME)

Semester-II	Computer Aided Drawing-Lab: BCE41201				
Teaching Scheme	Examination Scheme (Th)			Examination Scheme (P)	
Theory (Th)	-	-	-	-	-
Practical(P)	4Hrs/week	-	-	-	-
Total Credits	2	-	-	CA	25Marks
-	-	-	-	ESE	25Marks
-	-	-	-	Total	50Marks

Pre-Requisites: NA

Course Objectives:

1.	To understand the principles and importance of core building services such as water supply, lighting, ventilation, and waste management.
2.	To gain insights into environmental comfort systems including ventilation, acoustics, thermal insulation, and HVAC design.
3.	To explore modern building safety and automation systems including fire safety measures and smart controls.

Course Contents

Unit I	Building Services – Water, Waste, and Lighting Systems, Introduction to Building Services, Classification & Selection, Water supply and wastewater systems: planning, pipe sizing, venting, plumbing, Natural and artificial lighting systems: design principles, luminaries, illumination.
Unit II	Ventilation, Acoustics & Thermal Comfort: Importance and methods of natural and mechanical ventilation, Acoustics in buildings: sound properties, noise control, insulation techniques, Thermal insulation: heat transfer, insulating materials, comfort control.
Unit III	Air Conditioning, Fire Safety & Building Automation: Basics of HVAC and types of air conditioning systems, Fire safety systems: detection, alarms, fire-fighting equipment, Introduction to Building Automation: sensors, building management systems.

Text Books

T.1	Subhash C Sharma & Gurucharan Singh (2005), "Civil Engineering Drawing", Standard Publishers
T.2	Sham Tickoo Swapna D (2009), "AUTOCAD for Engineers and Designers", Pearson Education
T.3	Sikka, V.B. (2013), A Course in Civil Engineering Drawing, S.K.Kataria & Sons
T.4	Malik R.S., Meo, G.S. (2009) Civil Engineering Drawing, Computech Publication Ltd. New Asian

Reference Books

R.1	Engineering Graphics by P.J.Shah, Revised edition 2014, S Chand and Company Ltd., New Delhi, India.
R.2	Engineering Drawing by Basant Agarwal and C.M. Agarwal, 2 nd edition 2015, Tata Magraw Hill Publication Company Ltd., and New Delhi, India.
R.3	Steven Harrington, "Computer Graphics", A Programming Approach, 2nd Edition
R.4	Rogar and Adams, "Mathematical Elements of Computer Graphics", McGraw Hill.

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Useful Links	
1	http://www.nptelvideos.in/2012/12/computer-aided-design.html
2	https://nptel.ac.in/courses/105/104/105104148/

Sheet No.	List of Experiments/Drawing sheets	
1	Introduction to various CAD commands, units with simple example.	CO1
2	Introduction to computer aided drafting & coordinate system.	CO1
3	Exercise on Layer, Dimension, Texting & Block etc.	CO2
4	Drawing of building components like walls, lintels, Doors, Windows and Staircases.	CO2
5	Drawing a plan of Building dimensioning using layers and Developing sections and elevations for given Single story buildings.	CO3
6	Drawing a plan of Residential & Commercial Building.	CO4
7	Introduction to 3D commands.	CO4
8	Draw Isometrics & Orthographic views drawing.	CO5

CO	Course Outcomes	CL	Class Session
CO1	Summarize foundational knowledge to design water, lighting, and waste systems in accordance with building requirements.	2	4
CO2	Use and integrate thermal, acoustic, and ventilation solutions for occupant comfort and energy efficiency.	3	4
CO3	Apply fire safety systems and building automation technologies to improve safety and management.	3	4


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Department of Basic Sciences and Humanities

Program: B. Tech First Year (EE,ECE)

Semester-II Professional Etiquette : BSH41105

Teaching Scheme		Examination Scheme(Th)		Examination Scheme(P)	
Theory(Th)	-	CT-I	-	-	-
Practical(P)	2Hrs/week	CT-II	-	-	-
Total Credits	2(P)	CA	-	-	25 marks
Duration of ESE:		ESE	-	-	25 marks
		Total Marks	-	-	50 Marks

Pre-Requisites:

Course Objectives:

- To list key elements of personal grooming & dressing etiquettes
- To describe the characteristics and implications of various mindsets.
- To differentiate between professional and unprofessional behaviors in various academic and social contexts.

Course Contents

Unit I	Personal Grooming & First Impression Dressing Etiquette, Personal Cleanliness, Table Manners, Conversational Etiquette, Small Talk, Active Listening, Interruptions, Eye Contact, Smile, Handshake
	Activity : 1. Roleplay For meeting someone for the first time 2. Demonstration for table manners at a professional dinner.
Unit II	Introduction to Habit Formation & Soft Skills Meaning & Importance of Professional Etiquette & Soft Skills , Day to Day Manners, Definitions and Types of Mindset, Developing Learning Mindset & Growth Mindsets, Planning And Goal-Setting, Introduction to Habit Formation, Identifying various habits, Habit Cycle: Breaking Non-Productive Habits ,Using The Zeigarnik Effect For Productivity And Personal Growth, Developing Habits Of Success
	Activity : 1. Prepare a personal goal vision board 2. Identification of productive habits & non-productive habits through a worksheet
Unit III	Workplace Manners Meeting, Introduction at Meetings , Digital Etiquette, Workplace Ethics , Email Etiquette
	Activity :1.Writing a formal email 2.Case Study for understanding the real life scenario

Text Books

T.1	The Essentials of Business Etiquette by Barbara Pachter, McGraw Hill Education
T.2	Soft Skills- Enhancing Employability, M. S. Rao, I. K. International

Reference Books


R.1	Seven Habits of Highly Effective People by Steven Covey
R.2	You Can Win by Shiv Khara
R.3	Corporate Soft Skills by Sarvesh Gulati

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Useful Links	
1	https://nptel.ac.in/courses/109104107
2.	https://youtu.be/PuMX30xZktE?feature=shared

Sheet No.	List of Experiments	
1	To understand the importance of first impressions through grooming, dress, and body language.	CO1
2	To demonstrate proper table manners in a formal professional setting.	CO1
3	To develop non-verbal communication skills through eye contact and active listening	CO1
4	To visualize personal and professional goals through the creation of a vision board.	CO2
5	To identify and analyze productive and non-productive habits.	CO2
6	To understand the impact of mindset on learning and personal growth	CO2
7	To plan and manage time effectively through goal-setting and habit tracking.	CO2
8	To practice professional communication skills through formal email writing.	CO3
9	To analyze workplace scenarios for ethical behavior and decision-making.	CO3
10	To understand digital etiquette in professional online communication.	CO3

CO	Course Outcomes	CL	Class Session
CO1	Understand the key elements of personal grooming and appropriate dressing etiquette for academic and professional environments.	2	4
CO2	Formulate a personalized action plan for developing a growth mindset, setting realistic academic goals, and adopting positive habits for self-improvement.	3	4
CO3	Demonstrate between professional conduct across academic, social and virtual setting throw role play and discursion.	4	4


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Department of Basic Sciences and Humanities

Program: B. Tech First Year (EE,ECE)

SEMESTER-II | Digital Wellness & Basic Communication Lab - BSH41104

Teaching Scheme		Examination Scheme (Th)		Examination Scheme (P)	
Theory (Th)	-	CT-I	--	-	--
Practical (P)	4 Hrs./ Week	CT-II	--	-	--
Total Credits	2 (P)	CA	--	CA	25 Marks
Duration of ESE: --		ESE	--	ESE	25 Marks
		Total Marks	--	--	50 Marks

Pre-Requisites:-

Course Objectives:-

1. To introduce the concept of digital wellness and its importance in modern life.
2. To train students in using digital tools responsibly and maintaining mental health in digital environments.
3. To develop an understanding of effective communication in professional settings.
4. To develop written and oral communication skills for business contexts.
5. To enable students to present themselves professionally in online and offline environments.

Course Contents

Unit-I	The Basics of Digital Wellness – Introduction to Digital Wellness, Attention, Distraction, Principles and Practices from Yoga Philosophy, Techniques for developing Attention through Yoga, Difference between Stimulation and Relaxation, Attention Enhancers.
Unit-II	Science of Addiction and De-addiction – Habits and Addiction, Harnessing the Power of Neuroplasticity, Science and the Benefits of Physical Exercise.
Unit-III	Digital Detox – Techniques of Digital Detox, Seven-week Digital Wellness Plan, Digital Screens and Eye Health in Children.
Unit-IV	Introduction to Business Communication - Definition, types, and significance 7 C's of effective Communication, Barriers to communication and overcoming them, Verbal vs non-verbal Communication.
Unit-V	Written and Oral Communication - Email writing (professional emails), Report writing and Proposals, Business letters and memos, Resume and cover letter writing, Presentation skills, Public speaking and group discussions, Interviews (mock interviews), Meeting etiquettes.

Text Books:-

T1.	“Digital Wellness” publish Brahma Kumaris by Prajapita Vishwa Vidyalaya, Pandav Bhawan. Mount Abu, Rajasthan
T2.	“Business Communication” by Peter Hartley and Clive G. Bruckmann
T3.	“Business English for Success” by Scott McLean

Reference Books:-

R1.	Adair, John. Effective Communication. London: Pan Macmillan Ltd., 2003.
R2.	Carnegie, Dale. The Quick and Easy Way to Effective Speaking. New York: Pocket Books, 1977.
R3.	Guffey, Mary Ellen. Essentials of Business Writing. Ohio: South Western College Pubg., 2000.





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Useful Links:-

1.	https://www.brahmakumaris.com/digital-wellness
2.	https://www.youtube.com/watch?v=8eLjttXORIs

	LIST OF EXPERIMENTS (Digital Wellness & Basic Communication Lab - BSH41104)	CO
1	Introduction to Digital Wellness: A Study on Attention and Distraction	CO1
2	Enhance the Attention through Yoga	CO1
3	Habits and Addiction – Harnessing the Power of Neuroplasticity	CO2
4	Challenge of Digital Detox	CO2
5	Comparison Between Digital Reading and Print Reading	CO3
6	Create a Personal Digital Wellness Plan	CO3
7	Explore and build the Foundations for Better Communication	CO4
8	Navigate from Barriers to Bridges	CO4
9	Mastering Business Writing Skills	CO5
10	Develop Professional Communication Competence	CO5

CO	Course Outcomes	CL	Class Sessions
CO1	Identify the awareness of digital wellness principles and implement best practices	1	4
CO2	Explain professionalism and etiquettes in physical and virtual workspaces.	1	4
CO3	Summarize digital tools for productivity and effective professional communication	2	4
CO4	Understand key concepts of business and digital communication	2	4
CO5	Apply appropriate written and oral communication strategies in a business setting	3	4

				July, 2025	4.00	Applicable for AY 2025-26 Onwards
Chairperson	Dean Academics	Vice Principal	Principal	Date of Release	Version	